

REMARKS

Claims 26 and 28 have been amended to clarify that the substrate comprises a *dry* reinforcing fiber. The word “dry” disclosed in the specification in the context of the background and embodiments of the invention. For example, page 4, lines 23-29, of the specification states:

[The] methods employing an elastic inner mould where moulding is carried out under internal pressure to expand said inner mould are disclosed in US Patent 5,059,377, JP-A-54-13571 and JP-A-11-48318, but these are totally different from the method where a dry reinforcing fibre substrate is bagged, and resin injected in the low pressure state, *which is method of the present invention*
[Emphasis added.]

Furthermore, the embodiment on page 20, line 28 to page 21, line 5, further clarifies that the substrate comprises a dry reinforcing fiber through which resin is impregnated after the substrate is laid up on the inner mold.

Claims 28 and 41 were rejected as being obvious over Calapp in view of Darrieux. This rejection is respectfully traversed.

The Examiner acknowledges that Calapp does not disclose that the substrate is arranged at the surface of the inner mold such that the dry reinforcing fiber does not extend continuously for two laps of a circumference of the inner mold. To fill this gap, the Examiner resorts to Darrieux. First, let us review what Calapp and Darrieux actually disclose and then determine whether persons of ordinary skill in this art would have been motivated to combine these two references to arrive at the claimed invention.

Calapp relates to composite hockey shaft in which reinforcing fibers are tightly wound around a mandrel and resin is injected into the tightly wound fibers to embed the fibers in the resin, which is subsequently cured to form a composite hockey shaft. The reinforcing fibers in the hockey shaft of Calapp do not move, and should not move, during injection molding of the resin in order to maintain the orientation of the fibers in the hockey shaft. It is this orientation of the fibers in the hockey shaft that provides the desired balance between strength and flexibility of the hockey shaft.

Darrieux relates to “placing preimpregnated fibers on an expandable, extractable mandrel ... and expanding the mandrel inside a shaper while polymerizing the preimpregnated fibers.” See Abstract of Darrieux. The reason Darrieux suggests using splices of preimpregnated fibers that do not traverse over the circumference of the expandable mandrel is to allow the mandrel to be expanded during polymerization of the preimpregnated fibers. Calapp, on the other hand, does not require that the mandrel be expanded during polymerization of the resin. Therefore, persons of ordinary skill in this art would not have been motivated to splice the fibers of Calapp, as suggested by Darrieux, because such splicing would have destroyed the desired balance between strength and flexibility of the hockey shaft of Calapp.

Also, please note that Darrieux discloses winding preimpregnated fibers on an expandable mandrel while Calapp discloses winding dry fibers and later impregnating the dry fiber with a resin. As explained on page 4, lines 23-29, of the specification states “[the] methods employing an elastic inner mould where moulding is carried out under internal pressure to expand said inner mould ... are totally different from the method where a dry reinforcing fibre substrate is bagged” Because the processes of Calapp and Darrieux are totally different, there would further have been no motivation to combine the teaching of Calapp and Darrieux to arrive at the claimed invention.

Claims 26-28, 32-33, 37, 41, 46 and 50 were rejected as being obvious over WO 98/32589 (WO ‘589) in view of Nelson, further in view of Darrieux.

WO ‘589, Nelson and Darrieux all disclose that the substrate comprise reinforcing fiber that is preimpregnated (not dry), unlike a substrate that comprises a dry reinforcing fiber as recited in claims 26 and 28. For example, see page 11, lines 7-20 of WO ‘589; column 12, lines 21-26 of Nelson and the Abstract of Darrieux. The Examiner seems to indicate in the Action, *without any evidence*, starting at line from the bottom of page 4 to line on page 1, that Nelson discloses resin impregnation of a fiber before and after placement of the fiber in the mold, hence teaching that resin injection and resin pre-impregnation are equivalent alternatives. Applicants

have carefully reviewed Nelson and respectfully submit that the Examiner's position on this teaching of Nelson is incorrect.

In the case where a pre-impregnated substrate is arranged at a surface of an inner mold, the substrate is not able to slide easily during molding because the pre-impregnated substrate is sticky and tacky. This case would be like winding a tape with adhesive on both sides of the tape. On the other hand, the case where a dry substrate is arranged at a surface of an inner mold, the substrate is able to move and slide. Such a movement is a desired feature of the claimed invention as explained on page 32, lines 1-21, of the specification. The movement of the substrate in the embodiments of the claimed invention during molding is brought about by "arranging a substrate comprising, in part or in whole, a dry reinforcing fiber, wherein the substrate is arranged at the surface of the inner mold such that the dry reinforcing fiber does not extend continuously for two laps of a circumference of the inner mold" as recited in claims 26 and 28. In short, WO '589, Nelson and Darrieux all do not disclose a substrate that comprises a dry reinforcing fiber as recited in claims 26 and 28.

Claims 28, 32, 37-38 and 40-43 were rejected as being obvious over Holloway in view of Calapp further in view of Darrieux. This rejection is respectfully traversed.

Holloway, like Calapp, relates to "winding reinforcing fibers *tightly* around a hollow core" as explained in the Abstract (emphasis added). Therefore, persons of ordinary skill in this art would not have been motivated to splice the fibers of Holloway as suggested by Darrieux because such splicing would have destroyed the tight winding of Holloway's reinforced fibers.

Also, please note that Darrieux discloses winding preimpregnated fibers on an expandable mandrel while Holloway discloses winding dry fibers and later impregnating with the resin. As explained above, the methods employing an elastic inner mould where moulding is carried out under internal pressure to expand said inner mould are totally different from the method where a dry reinforcing fibre substrate is bagged. Because the process of Holloway is totally different from that of Darrieux, there would further have been no motivation to combine

the teaching of Holloway and Darrieux, much less to combine the teachings of Holloway, Calapp and Darrieux, to arrive at the claimed invention.

Claim 34 was rejected as being obvious over Holloway in view of Calapp and further in view of Darrieux and Johnson. Claims 34-36, 47-49 were rejected as being obvious over Holloway in view of Calapp and further in view of Darrieux and Tunis. Claim 39 was rejected as being obvious over Holloway in view of Calapp and further in view of Darrieux and WO 98/30374 (WO '374). These rejections are respectfully traversed.

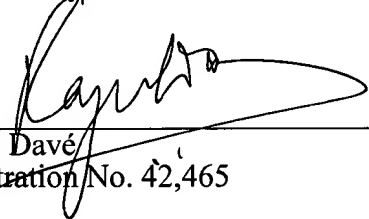
In the previous Action of June 30, 2004, the Examiner made the same rejections as above except that the Examiner applied JP 62-87332 instead of Darrieux. As explained above, there would have been motivation to combine Darrieux with either Calapp or Holloway. The additional references cited (such as Johnson, Tunis, and WO '374) also do not provide the motivation to make a combination such that persons of ordinary skill in the art would have arrived at the claimed invention. Johnson has been relied for teaching a molding process including providing a blow molded core having a plurality of grooves molded therein. See page 9, lines 9-10, of the Action. Tunis has been relied for teaching a molding process including a core, wrapping the core with the fiber-reinforced material to form a wrapped core, wrapping the wrapped core in a vacuum bag assembly, drawing a vacuum and injecting a resin into the bag to form a fiber reinforced article. See page 10, lines 6-10, of the Action. WO '374 has been relied for teaching a tackifier. See page 12, line 6, of the Action. In short, the Examiner too has not relied on these additional references to show that they provide a motivation to combine Darrieux with either Calapp or Holloway.

In light of the above, a Notice of Allowance is respectfully solicited.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. **360842007500**. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: June 7, 2005



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